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10/068,005	02/08/2002	Hyo-Sang Jung	262/011	6445

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EXAMINER

PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/068,005

Applicant(s)

Hyo - Sang Jung

Examiner

M.L. Padgett

Group Art Unit

1762

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 7/14/03
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-10 is/are pending in the application.
- Of the above claim(s) 1-7 is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 8-10 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

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1. Applicant's election without traverse of Group II, claims 8-10 in Paper No. 6 (mail date 7/14/03) is acknowledged.

2. Claims 8-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 8, line 5, what is intended by "external pressures" is unclear or ambiguous, as how the external pressure is defined is unspecified. Is it atmospheric pressure which can be considered external, or is it the pressure in some other part of the ion implantation system, which may be lower than atmospheric, but higher than what would be in the ion generator if inert gas was not added, or what?

In line 11 of claim 8, how does "the inside of the ion generator" differ from the previously introduced "the interior..." from line 4? If they are intended to be the same limitation, the terms should be kept consistent.

What does applicant intend by "impurity" (claim 8, line 12, and claim 10)? Generally, when discussing an impurity in an apparatus, one means contamination that is undesirable, and should be removed, but may be unavoidably present in some degree. Claim 10 appears to require all 3 of P, H and Mg to be present at once. Is this intended? Page 1 of the specification appears to indicate that the impurities of claim 10 (thus 8) are not contaminants at all, but the same materials or gases intended to be used for ion implantation or residues thereof. Clarification of the claim language is recommended, but as present by written and in light of all above possibilities, "flammable impurities" will be taken to mean any material, i.e. gas, residue, contaminate, etc., that may react with oxygen spontaneously or exothermically.

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For "inert gas" to be a defined term, it must refer to that category of elements in the periodic table, also called noble gases or rare gases (or be defined in the specification, but p.3, [0009] gives examples, not a definition), otherwise "inert" is a relative term, which is vague and indefinite as it is lacking clear metes and bounds, because there is no limits with respect to what, the gas is inert. For example, N₂ is well known to react with many compounds, hence is not inert, unless what it is inert with respect to, is defined.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8-10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Beck et al.

Beck et al teach use of ion implantation systems that employs a hollow-cathode ion source, where the discharge chamber uses tungsten filaments for the cathode and electron emission, where a new filament must be inserted at the end of each filaments' "life" (i.e. the generator opened to replace the used up, hence damaged, part). At the start of an implantation run (so at the beginning after closing following the replacement) the system is connected to an argon source, which flows from the oven with the implantation material to be evaporated into the

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discharge chamber to result in gas pressure of 10^{-3} - 10^{-2} torr for the two chambers (possibly reading on meanings of unclear "equalize...pressures"). As the ion source material is evaporated to increase its partial pressure to that required for maintaining the plasma discharge, the flow of Ar is cut off (another possible meaning for "equalize..."). See the abstract; Col.1, lines 6-7; Col. 4, line 45-Col. 5, lines 10 and 21-34. Note while there is no discussion of oxygen and inflammable impurities, the act of flowing through Ar at the start of a process will inherently flush out and remove any residual air (contains H_2 , H_2O , etc.) and any other gases or various remaining contaminants, etc. Alternately, it would have been obvious to one of ordinary skill in the art, to flush out any chamber that requires processing under vacuum, as does that of Beck et al, in order to remove traces of atmospheric gases, and previous use residues, in order to avoid contaminating new products with undesirable materials. Also, the uncertainty of the meaning of "equalize..." makes the 102/103 appropriate.

5. The patents to Nishida (abstract; summary; col.1, lines 5-27 and 42-52; and Col. 2, lines 18-55; etc.) and Druz et al (abstract; claims 8, 20, 24, etc; Col. 5, lines 31-39 and 62-Col. 6, line 24;etc.) are cumulative to the above rejection, as teaching reasons for flushing ion generating system with non-reactive (inert, Ar gases or purge gases) in order to remove or exclude water and O_2 .

6. Claim 10 is ejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al as applied to claims 8-9 above, and further in view of Yang et al or Carpenter et al.

Beck et al is only concerned with ion implantation of B, and does not use a hydrated source therefor, hence except for flushing residual H_2 , H_2O and other H-containing gases from air exposure when changing filaments, does not have H in the system. However, other dopants are

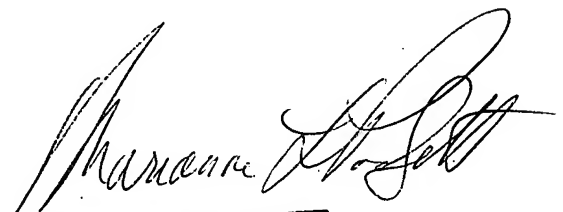
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well known to be ion implanted, with Yang et al (implants B, P, As, Ab, etc.; vents, evacuates and flushes with N₂ or Ar to reduce/prevent cross-contaminating: Abstract; Fig. 6 - flow chart; col.3, lines 65-col.4, line 9; col.5, line 49-col. 6, line 8; and claims 1, 6, 7, 8) or Carpenter et al (N₂ flush in source between implantations, where GeF₄...BF₃... AsH₄ and PH₃ are possible sources for implantation material and extending the lifetime of the ion source is a concern: abstract; figures; col.1, lines 5-58; col.3, line 11-29 and 60-65; col.4, line 11-20, 30-36 and 45-67; col.5, has 16-35; and claims 1, 5, 10, etc.) demonstrating use of claimed impurities in implantation sources, and the known need to flush systems with claimed gas to prevent contaminations of later products and to extend the lifetime of the source, all consistent with Beck et al. Conversely, the taught need in Beck et al of replacing filaments will also effect hot cathode systems of Yang et al or Carpenter et al, where the taught needs to extend lifetime and reduce contamination would have been considered by one of ordinary skill in the art to apply to sources of those problems known to come from opening up the system to air. Alternatively phrased, it is a matter of competent work workmanship to pump down ones chamber and flush it out before beginning any vacuum process, especially one where either apparatus and/or product are susceptible to damage from contaminates.

7. Other art of interest includes Satoh et al, which has further discussion of cleaning techniques for ion sources (col.2-3), pr analogously Magee et al (abstract; Figures; Summary).

8. Any inquiry concerning this communication should be directed to M. L. Padgett at telephone number (703) 308-2336 on Monday-Friday from about 8:30 am- 4:30 pm; and Fax#(703) 872-9306 (all formal) or 305-6078 (informal).

M.L Padgett/lap 10/06/03 & 10/14/03



MARIANNE PADGETT
PRIMARY EXAMINER